Abstract English

Dissertation Thomas Sillekens:
Aggregierte Produktionsplanung in der Automobilindustrie unter besonderer Berücksichtigung von Personalflexibilität

Competition in the automotive industry is still high. The efficient utilization of production and workforce capacity in the context of aggregate production planning is an important competitive advantage. In this work a new mixed integer linear programming approach to solve the problem for flowshop production lines is presented. The case of a single stage flowshop production line is considered as well as the multi stage case with several production lines connected by buffers. In this context it is important to consider adaptation possibilities arising from workforce flexibility such as different shiftmodells, working time accounts and the structure of the workforce. To gain feasible production plans regulations regarding the change of production and workforce capacity have to be considered. A model which can cope with these problem characteristics is presented. Moreover a framework containing different model improvements and primal heuristics to solve these problems efficiently is developed. The entire solution method is implemented as a Decision Support System (DSS). With the help of the DSS runtime results for different test instances are generated and analyzed to demonstrate the successful applicability and limits of the approach.

Keywords: Automotive Industry, Aggregate Production Planning (APP), Decision Support System (DSS), Mixed Integer Programming (MIP), labour flexibility